

PENG et al  
Appl. No. 10/526,469  
November 15, 2006

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**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 (currently amended). A method of producing mechanical pulp, comprising:  
initially compressing a fiber material;  
impregnation of selectively weakening a pectin-enriched region in the fiber walls  
of the fiber material by impregnating fiber material with an enzyme a pectinase  
containing aqueous liquid resulting in hydrolysis of the pectins;  
prior to defibration defibrating and refining of the fiber material to produce a  
mechanical pulp;  
characterised in said enzyme-containing aqueous liquid being a pectinase-  
containing aqueous liquid and in initial compression of the fiber material.

2 (currently amended). A method according to claim 1, ~~characterised in that~~  
wherein said initial compression of the fiber material is a mechanical compression,  
~~preferably combined with a thermal pretreatment of the fiber material, preferably by~~  
~~steaming, before the impregnation.~~

3 (currently amended). A method according to claim 2 23, ~~characterised in~~  
~~that~~ wherein said steaming is carried out, preferably at atmospheric pressure, for 1 to 30  
min, preferably 10 to 20 min.

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4 (currently amended). A method according to claim 2, ~~characterised in that~~  
wherein compression is performed by a compression screw or a twin roll press, with a  
compression ratio of 1:1 to 8:1, ~~preferably 2:1 to 5:1.~~

5 (currently amended). A method according to claim 1, ~~characterised in that~~  
wherein the pectinase-containing liquid comprises an enzymatic preparation with  
pectolytic activity for both pectins and esterified pectins.

6 (currently amended). A method according to claim 1, ~~characterised in that~~  
wherein the aqueous liquid comprises two or more enzymatic preparations wherein at  
least one of the preparations has pectinase activity.

7 (currently amended). A method according to claim 1, ~~characterised in that~~  
wherein the pectinase is added as a biological agent comprising one or more fungi or  
bacteria, at least one of which having pectolytic activity.

8 (currently amended). A method according to claim 1, ~~characterised in that~~  
wherein the pectinase arises from a group of microorganisms containing *Aspergillus*  
*aculeatus* and *Aspergillus oryzae*.

9 (currently amended). A method according to claim 1, ~~characterised in that~~  
wherein the charge of pectinase is 2,000,000 to 200,000,000 polygalacturonase

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units/ton fiber material, preferably 10,000,000 to 50,000,000 polygalacturonase units/ton.

10 (currently amended). A method according to claim 1, characterised in that wherein the aqueous liquid comprises at least one chelating agent, preferably diethylenetetraminepentaacetic acid at a charge of 1 to 10 kg/ton and/or sulfite at a charge of 5 to 50 kg/ton.

11 (currently amended). A method according to claim 1, characterised in that wherein a retention time after uptake of the impregnation liquid is 3 min to 24 hours, preferably 15 to 240 min, and more preferably 30 to 120 min.

12 (currently amended). A method according to claim 11, characterised in that wherein a temperature in the retention after uptake of the impregnation liquid is 20 to 100°C, preferably 35 to 70°C, and more preferably about 50°C.

13 (currently amended). A method according to claim 1, characterised in that wherein a pH in the impregnation liquid is 3 to 10, preferably 4 to 7, and more preferably about 5.

14 (currently amended). A method according to claim 1, characterised in that wherein the defibration and refining of the fiber material is performed by use of single disc, double disc or conical refiners in one or multi stages.

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15 (currently amended). A method according to claim 14, ~~characterised in that~~  
wherein a refiner rotation speed is 1000 to 3000 rpm, ~~preferably 1500 to 2600 rpm.~~

16 (currently amended). A method according to claim 14, ~~characterised in that~~  
wherein the fiber material is preheated for 2 to 10 min before refining, ~~that a refiner~~  
pressure is from atmospheric up to 5 bar, ~~preferably up to 4 bar~~ and ~~that a refiner~~  
rotation speed ~~preferably~~ is 1200 to 1800 rpm.

17 (currently amended). A method according to claim 14, ~~characterised in that~~  
wherein the fiber material is preheated for 3 to 30 sec before refining, ~~that a refiner~~  
pressure is from 4 to 8 bar, ~~preferably 5 to 8 bar~~ and ~~that a refiner rotation speed~~  
~~preferably~~ is above 2000 rpm.

18 (currently amended). A method according to claim 1, ~~characterised in that~~  
wherein said fiber material is softwood chips or hardwood chips.

19 (currently amended). A method according to claim 1, ~~characterised in that~~  
wherein the fiber material is non-wood fiber material including bagasse, bamboo, reed  
and straw.

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20 (currently amended). A method according to claim 1, ~~characterised in that~~  
wherein the pulp obtained after defibration and refining is bleached, ~~preferably with~~  
~~alkaline peroxide~~, to obtain bleached pulp having high brightness.

21 (currently amended). Mechanical pulp, ~~characterised in that it has been~~  
produced according to claim 1.

22 (new). A method according to claim 2, wherein said mechanical  
compression is combined with a thermal pretreatment of the fiber material before the  
impregnation.

23 (new). A method according to claim 22, wherein said thermal pretreatment  
of the fiber material is performed by steaming.

24 (new). A method according to claim 23, wherein said steaming is carried  
out for 10 to 20 min.

25 (new). A method according to claim 4, wherein said compression ratio  
2:1 to 5:1.

26 (new). A method according to claim 10, wherein the chelating agent is  
diethylenetetraminepentaacetic acid.

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27 (new). A method according to claim 11, wherein the retention time after uptake of the impregnation liquid is 15 to 240 min.

28 (new). A method according to claim 11, wherein the retention time after uptake of the impregnation liquid is 30 to 120 min.

29 (new). A method according to claim 12, wherein a temperature in the retention after uptake of the impregnation liquid is 20 to 100°C.

30 (new). A method according to claim 13, wherein the pH in the impregnation liquid is 4 to 7.

31 (new). A method according to claim 15, wherein the refiner rotation speed is 1500 to 2600 rpm.

32 (new). A method according to claim 16, wherein the refiner pressure is from atmospheric up to 4 bar.

33 (new). A method according to claim 17, wherein a refiner pressure is from 5 to 8 bar.

34 (new). A method according to claim 20, wherein the bleaching is with alkaline peroxide.